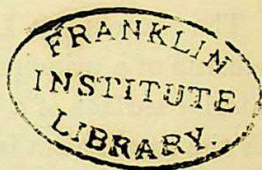


A.D. 1869, 16th NOVEMBER. N° 3309.

Metallic Manometer.



LETTERS PATENT to Ferdinand Delacroix, of Paris, Boulevard de Strasbourg, 23, Mechanician, for the Invention of "AN IMPROVED METALLIC MANOMETER."

Sealed the 16th May 1870, and dated the 16th November 1869.

PROVISIONAL SPECIFICATION left by the said Ferdinand Delacroix at the Office of the Commissioners of Patents, with his Petition, on the 16th November 1869.

I, FERDINAND DELACROIX, of Paris, Boulevard de Strasbourg, 23,
5 Mechanician, do hereby declare the nature of the said Invention for "AN IMPROVED METALLIC MANOMETER," to be as follows:—

The important part which the manometer plays in the action of
boilers renders it an instrument of the highest importance. Since the
appearance of the first metallic manometer, of which M. Bourdon was
10 the inventor, many attempts have been made to contrive instruments
of this description which would avoid the faults of the first one, but I
know of none which will indicate correctly the slighter fluctuations of
the pressure.

Delacroix's Improved Metallic Manometer.

In order to make an instrument as nearly perfect as may be the following questions must be resolved :—

First. The construction of a metallic manometer of great simplicity and at the same time of the greatest sensibility.

Secondly. To produce it at a low price and consequently to make its 5 parts few and simple.

Thirdly. To render it easy of repair and without requiring special skill for that purpose.

Fourthly and lastly. To fix the needle by attaching it to one of the rigid organs of the movement so that it may be free from all 10 vibration.

The manometer I have contrived fulfils all the above conditions. It consists of a principal frame upon which a cock is screwed fix to the interior surface of a box by means of two screws, the frame upon which all the mechanism is hung is pierced throughout its length in order to 15 permit the steam to proceed to its upper part, and enter a chamber formed in a box. Upon one of the faces of this box at and down to the half of its length a large orifice is made which forms a bearing in which a circular membrane or diaphragm which may be of metal or simply of caoutchouc is fitted. This membrane is strongly pressed 20 upon its bearing by a screwed collar or ring which makes with it a hermetic joint. The vertical arrangement of this membrane and the facility of replacing it instantly are two essential points of my Invention. A piece in the form of a piston enters freely into the screw collar or ring and presses on the one side upon the membrane and upon the 25 other upon a spring which may be considered the fundamental piece of the new manometer. This spring lever, which is of a looped or bent over form, is attached by one of its legs to the rear part of the box, the other leg carries in line with the axis of the membrane an adjustable screw, which should always be in contact with the piece, so that the 30 least effect exercised upon the membrane must necessarily act upon the spring, the longer leg of which carries the adjusting screw and terminates in a rigid lever arm attached to the rod which communicates its movement to a sector and pinion intended to actuate the needle.

There results from the arrangement just described that it is sufficient 35 for a slight depression of the membrane to cause a complete revolution of the needle or index hand.

Delacroix's Improved Metallic Manometer.

A very simple mode of actuating the needle without a sector is as follows :—I attach the arm which is connected to the spring to work the needle direct.

SPECIFICATION in pursuance of the conditions of the Letters Patent,
5 filed by the said Ferdinand Delacroix in the Great Seal Patent Office on the 16th May 1870.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, FERDINAND DELACROIX, of Paris, Boulevard de Strasbourg, 23, Mechanician, send greeting.

10 WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Sixteenth day of November, in the year of our Lord One thousand eight hundred and sixty-nine, in the thirty-third year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Ferdinand Delacroix, Her special licence
15 that I, the said Ferdinand Delacroix, my executors, administrators, and assigns, or such others as I, the said Ferdinand Delacroix, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend,
20 within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**AN IMPROVED METALLIC MANOMETER**," upon the condition (amongst others) that I, the said Ferdinand Delacroix, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly
25 describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Ferdinand Delacroix, do hereby
30 declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, reference being had to the Drawings hereunto annexed, that is to say :—

The important part which a manometer plays in the action of boilers
35 renders it an instrument of the highest importance. Since the appearance

Delacroix's Improved Metallic Manometer.

of the first metallic manometer, of which M. Bourdon was the inventor, many attempts have been made to contrive instruments of this description, which would avoid the faults of the first one, but I know of none which will indicate correctly the slighter fluctuations of pressure.

5

In order to make an instrument as nearly perfect as may be the following questions must be resolved:—

1st. The construction of a metallic manometer of great simplicity and at the same time of the greatest sensibility.

2ndly. To produce it at a low price and consequently to make its 10 parts few and simple.

3rdly. To render it easy of repair and without requiring special skill for that purpose.

4thly, and lastly. To fix the needle by attaching it to one of the rigid organs of the movement, so that it may be free from all vibration.

15

The manometer I have contrived fulfils all the above conditions, and I proceed to describe it with reference to the annexed Drawings. It consists of a principal frame A upon which a cock R is screwed, fixed to the interior surface of a box B by means of two screws V, V. The frame A, Figure 1, upon which all the mechanism is hung is pierced 20 throughout its length in order to permit the steam to proceed to its upper part C, and enter a chamber formed in a box. Upon one of the faces of this box at and down to the half of its length a large orifice is made which forms a bearing in which a circular membrane or diaphragm which may be of metal or simply of caoutchouc is fitted. This 25 membrane is strongly pressed upon its bearing by a screwed collar or ring E which makes with it a hermetic joint. The vertical arrangement of this membrane and the facility of replacing it instantly are two essential points of my Invention. A piece P in the form of a piston enters freely into the screw collar or ring E and presses on the one side 30 upon the membrane M and upon the other upon a spring R¹, which may be considered the fundamental piece of the new manometer. This spring lever R¹ which is of a looped or bent over form is attached by one of its legs F to the rear part of the box C, the other leg G carries in line with the axis of the membrane an adjustable screw V¹, which should always be 35 in contact with the piece P, so that the least effect exercised upon the membrane M must necessarily act upon the spring R¹, the longer leg G

Delacroix's Improved Metallic Manometer.

of which carries the adjusting screw and terminates in a rigid lever arm attached to the rod H which communicates its movement to a sector and pinion S intended to actuate the needle.

There results from the arrangement just described that it is sufficient
5 for a slight depression of the membrane M to cause a complete revolution of the needle or index hand.

Figure 2 shows a very simple mode of actuating the needle without a sector which is as follows:—I attach the arm which is connected to the spring to work the needle direct. I may make the spring lever R¹
10 of one or several parts, and I may place it either to the right or to the left of the box which carries the elastic membrane.

And having now described the nature of my said Invention, and in what manner the same is to be performed, I declare that I claim the manufacture and employment of my improved metallic manometer,
15 substantially as herein-before described and illustrated in the accompanying Drawings.

In witness whereof, I, the said Ferdinand Delacroix, have hereunto set my hand and seal, this Eighth day of May One thousand eight hundred and seventy.

20

FERDINAND DELACROIX. (L.S.)

Witness,

CH. ARMENGAUD,

Eng^r. Civil,

Boulevard de Strasbourg, 23,

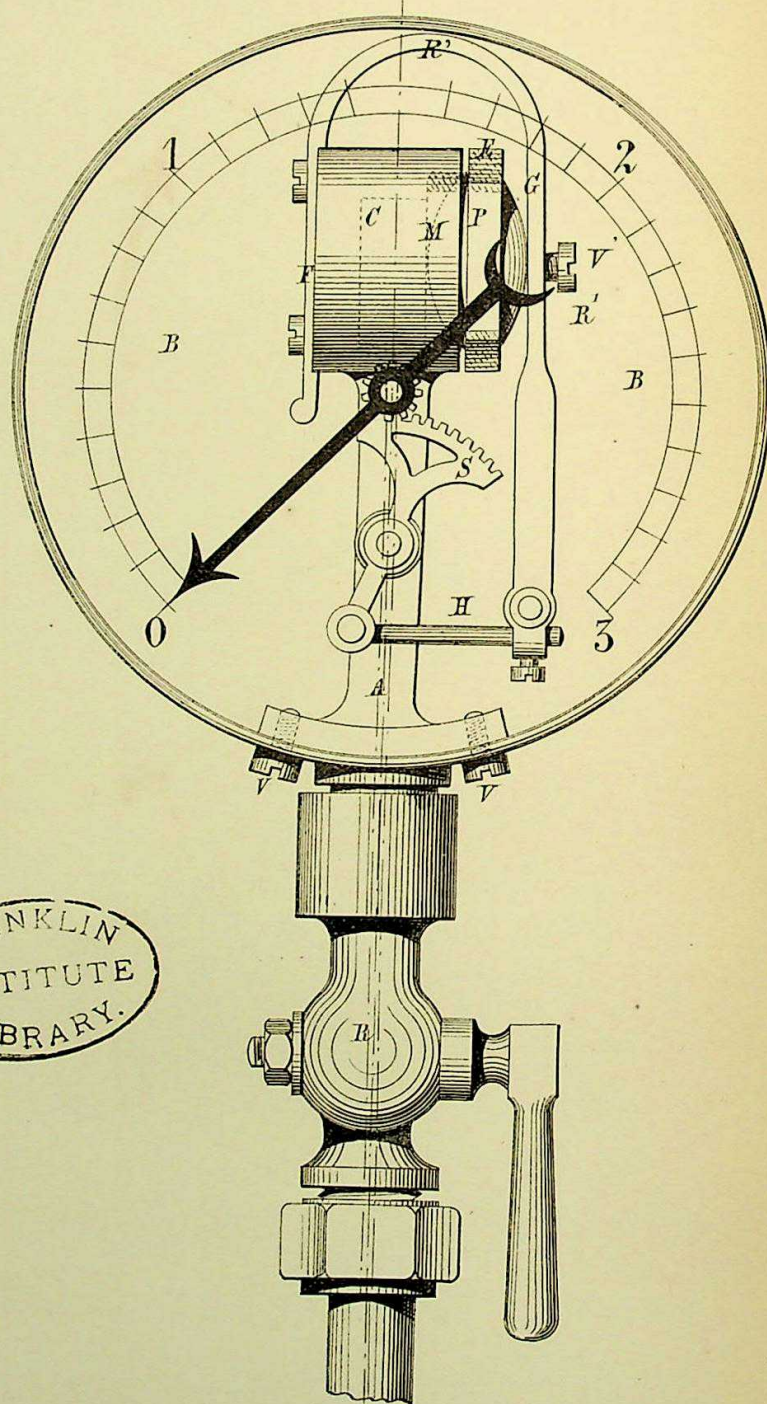
25

à Paris.

LONDON:

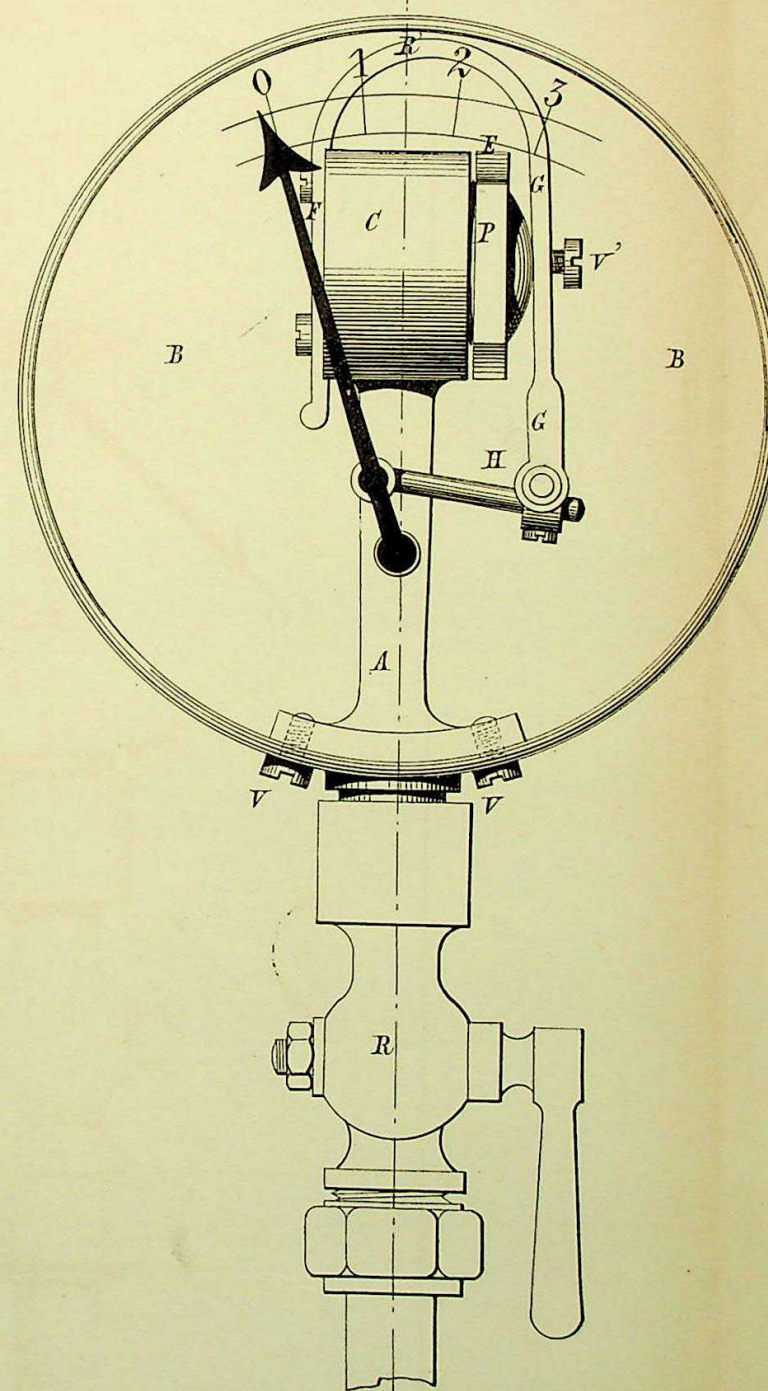
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1870.

FIG. 1.



FRANKLIN
INSTITUTE
LIBRARY.

FIG. 2.



The filed drawing is partly colored.

Drawn on Stone by Malby & Sons